UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,273	01/05/2001	Jun-hee Choi	030681-276	3038

7590 11/05/2003

Charles F. Wieland III
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, VA 22313-1404

EXAMINER	
KEANEY, ELIZABETH MARIE	
ART UNIT	**PAPER NUMBER**
2882	

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/754,273	Applicant(s) CHOI ET AL.	
	Examiner Elizabeth Gemmell	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,14 and 15* is/are pending in the application.

4a) Of the above claim(s) *3-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,14 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *07 August 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Receipt is acknowledged of Amendments and Remarks filled 7 August 2003.

Drawings

The proposed drawing corrections are approved and have been placed in the file.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1,2,14 and 15, drawn to a field emission device, classified in class 313, subclass 309.

II. Claims 3-13, drawn to the method of making a field emission device, classified in class 445, subclass 24.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the FED does not require a carbonaceous polymer layer on the gate electrode and the micro-tips can be made of a combination of materials.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

The Examiner respectfully traverses the arguments submitted regarding the Election with traverse found in paper number 7. First, the Applicant asserts that the Election of Group I, drawn to claims 1 and 2, was made with traverse. However, MPEP § 813.03 (a) states that in order to be entitled to reconsideration or further examination of the restriction requirement, the Applicant's reply must distinctly and specifically point out the supposed error's in the examiners reasons for restriction. Merely stating the election is made with traverse fails to distinctly and specifically point out the supposed defect in the Examiners restriction requirement and the election is therefore treated as an election without traverse.

The Applicant further asserts that claims 3-13 should be concurrently examined with claims 1 and 2. Regarding claims 12 and 13, the Applicant references MPEP § 806.05 for justification as to why claims 12 and 13 should be examined with claims 1 and 2. MPEP § 806.05 fails to show any evidence that a claim drawn to a process must be examined concurrently with a claim drawn to an apparatus. However MPEP § 821.04 states, "When product and process claims drawn to independent and distinct inventions are presented in the same application, the applicant may be called upon to elect claims to either the product or process. If the applicant elects claims directed to the product, and the product claim is subsequently found allowable, the withdrawn

process claims, which otherwise include all the limitations of the allowable product claim will be rejoined". In the instant case, however, claims 12 and 13 do not include all the limitations of the apparatus claims. Therefore, grouping claims 12 and 13 to Group II within the restriction is proper and they will be withdrawn from further consideration. The Examiner further notes that should claims 12 and 13, during the course of prosecution, warrant rejoining to Group I, claims 3-11 would not necessarily have to be rejoined and examined.

The restriction requirement is still deemed proper and is therefore made FINAL.

Response to Arguments

Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

The Examiner notes that while searching for the new limitation added to claim 1 "the micro-tip being of a homogenous material", Nakamoto was found to further teach the micro-tips being of a homogenous material in column 5, line 14. Although the same references are implemented in the rejection, the grounds of the rejection have changed due to the new limitation added.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamoto (US Patent 6,097,138).

Re claim 1: Nakamoto discloses, in figure 16 and throughout the disclosure, a field emission device comprising:

- a substrate (112);
- a cathode (114) formed over the substrate;
- micro-tips (118) having nano-sized features (122) each micro-tip being of homogenous material (column 5, line 14), formed in electrical contact with the cathode;
- a gate insulation layer (126) with wells, each of which a single micro-tip is located in, the gate insulation layer formed over the substrate;
- a gate electrode (128) with gates aligned with the wells, such that each of the micro-tips is exposed through a corresponding gate, the gate electrode formed on the gate insulation layer.

Re claim 14: Nakamoto discloses, in figure 16 and throughout the disclosure, a field emission device comprising:

- a substrate (112);
- a cathode (114) formed over the substrate;
- micro-tips (118) having nano-sized features (122), formed in electrical contact with the cathode;
- a gate insulation layer (126) with wells, each of which a single micro-tip is located in, the gate insulation layer formed over the substrate;
- a gate electrode (128) with gates aligned with the wells, such that each of the micro-tips is exposed through a corresponding gate, the gate electrode formed on the gate insulation layer.

The Examiner notes the claim limitation "forming a carbonaceous layer...features are formed" is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent of showing an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamoto in view of Itoh et al. (US Patent 5,892,321; hereinafter Itoh).

Nakamoto shows all the limitations as shown above.

However, Nakamoto fails to teach or suggest a resistance layer over or beneath the cathode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a resistance layer to the FED disclosed by Nakamoto because in using a resistance layer the amount of emission current radiated from the mico-tips is reduced (column 6, lines 40+), thereby improving the image produced by the device.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US Patent 6,632,114 discloses the method of making an FED having micro-tips with nano-sized surface features.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Gemmell whose telephone number is (703) 305-1937. The examiner can normally be reached on Monday-Thursday 6:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DAVID V. BRUCE
PRIMARY EXAMINER

emg